

EVEN-FIRING, FULLY BALANCED, V-TWIN ENGINE**ABSTRACT OF THE DISCLOSURE**

A V-twin engine includes a two cylinder reciprocating apparatus, having a pair of connecting rods joined to a crankshaft through a pair of connecting rod journals that are centered at a common throw radius from the crankshaft axis, and angularly displaced from one another along the throw radius by an angular displacement equal to an included angle defined by axes of the cylinders, so that the pistons will move in unison and each reach top dead center (TDC) and bottom dead center (BDC) in their respective cylinders at substantially the same time. The cylinders fire alternately on sequential rotations the crankshaft. Counterweights on two balance shafts rotate in a 1:1 rotation ratio in a direction opposite to the crankshaft, with forces from the balance shaft counterweights and a crankshaft counterweight alternately aligning and opposing for counterbalancing vertical forces and unbalance loads in the engine.